DOCUMENT RESUME

ED 196 607 RC 012 422

AUTHOR	Gray, Morris J.: And Others
TITLE	Rural vs. Suburban Residential Choice: A Progress Report. Technical Report 107A.
INSTITUTION	Iowa Univ., Iowa City. Inst of Urban and Regional Research.
SPONS AGENCY	National Science Foundation, Washington, D.C.
PUB DATE	Aug 78
GRANT	SOC-77-12752
NOTE	21p.: Paper copy not available due to publisher's preference. Submitted for session on spatial choice at the Transportation Research Board Meeting (1979).
AVAILABLE FROM	Institute of Urban and Regional Research, N246-OH, Oakdale Campus, The Univ. of Iowa, Iowa City, IA 52242 ($1.00).
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Family Characteristics; Family Mobility; *Housing Needs; Land Settlement; *Place of Residence; *Relocation; *Residential Patterns; *Rural Areas; Rural Urban Differences; Socioeconomic Influences; *Suburban Housing; Urban to Rural Migration; Urban to Suburban Migration
IDENTIFIERS	*Iowa

ABSTRACT

As part of an ongoing investigation to determine the locational behavior of single-family-housing residents on the metropolitan fringe, a pilot study was conducted which simulated residential choice by asking respondents to rate the economy, convenience, and desirability of rural housing descriptions relative to a standard suburban residence. Four factors were manipulated: (1) size and arrangement of lots within a development; (2) monthly mortgage payment; (3) distance from work and shopping; and (4) availability of public services. Thirteen people representing three subgroups of suburbanites, exurbanites, and precludeds made choices to the simulated suburban/rural housing preferences on rating scales and questionnaires. Analysis of the rating data showed that each factor by itself was an important determinate of the desirability, economy, and convenience ratings. Individual differences were found to be related to sociodemographic factors, previous housing history, and current and projected lifestyles. Further investigations were planned to apply the methodology to a group of consumers in the housing market, and thereby predict housing decisions and estimate the latent demand for alternative nonurban housing characteristics. (Author/JD)

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ED196607

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RURAL VS. SUBURBAN RESIDENTIAL CHOICE:

A PROGRESS REPORT

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Irwin P. Levin, and Kenneth J. Dueker

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August 1978

Technical Report 107A

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Submitted for session on spatial choice at the 1979 Transportation Research Board meeting. The research described in this paper was sponsored by National Science Foundation Grant No. SOC 77-12752. The authors wish to thank Alan Phipps, Bob Ericksen, and George Woodworth for their contributions to the initial phase of this project.

Abstract

The Institute of Urban and Regional Research at the University of Iowa is conducting an investigation of the locational behavior of single-family-housing residents on the metropolitan fringe. An initial phase of the investigation used data from a Bureau of the Census 1975 Annual Housing Survey to distinguish between single-family urban and rural nonfarm dwellers according to various attributes of house, neighborhood, and public services. The next phase was designed to assess ways in which households moving from urban areas trade off such attributes for rural vs. suburban residential choice. In this phase, a survey was presented which simulated residential choice by asking respondents to rate the economy, convenience, and desirability of rural housing descriptions relative to a standard suburban residence. The following attributes of the rural alternative were manipulated: lot size and type of development, monthly cost, distance from work and shopping, and nature of public services. Respondents ranged from students who "role played" the rural/suburban housing decision to people who have recently made such a decision. The survey allowed us to assess the degree of preference for rural vs. suburban housing for each respondent, the relative weighting of factors for that respondent, and estimate an overall judgment model for any subset of the group. Individual differences were related to sociodemographic factors, previous housing history, and current and projected lifestyles. The next phase of the investigation will be to apply this methodology to a group of consumers in the housing market and thereby predict housing decisions and estimate the latent demand for alternative nonurban housing characteristics.

Introduction

Over the past quarter century, growth in the urban housing market has been primarily characterized by suburbanization and sprawl at the metropolitan fringe. This process was to a large extent stimulated by growth in personal income, favorable interest rates, improvements in transportation systems, and changing spatial patterns of employment opportunities. New developments of low density single-family dwellings have extended the geographical range of most every metropolitan area of the United States. Oftentimes, development has occurred at such a rapid pace that new housing tracts were constructed at distances previously considered beyond a reasonable commuting range from work places in the city. In addition, developments in many instances were noncontiguous to the metropolitan area itself. This process has been termed "leap frogging."

Data collected by the Bureau of the Census clearly indicate a shift in housing construction not only from the central cities to the suburbs but also from the suburbs to rural areas surrounding metropolitan centers. This process is reflected in Table I by data taken from a sample of 1975 Annual Housing Survey statistics.

Rapid development of residential housing at the urban fringe has been a matter of great concern and study by metropolitan planners, among others, who see the process contributing to inefficiency and disparities in the use of transportation systems, the provision of utilities and other public services associated with urban life, and in the management of scenic and environmentally sensitive areas. Efforts to monitor and influence the development process by public officials (e.g., through the use of zoning and metropolitan plans), however, have to a large extent failed to achieve their intended purpose. For the most part, this has been due to the fact that

Table I

Frequency (Percent) of Houses Built

During Year Intervals for Each Subsample

Subsample	1950-59	1960-64	1965-69	1970-75
Metropolitan Areas*	2,121 (44.7)	1,104 (43.9)	1,167 (43.2)	1,028 (40.9)
Suburbs	2,083 (43.9)	988 (39.3)	854 (31.6)	546 (21.7)
Rural Areas	538 (11.3)	424 (16.8)	679 (25.1)	941 (37.4)

*The term Metropolitan Area is defined by the Bureau of the Census as "Standard Metropolitan Statistical Area." This includes the central city and all contiguous developed counties functionally linked to the city.

metropolitan areas are composed of a myriad of political jurisdictions, whose priorities may rarely be consistent. While some communities view development as a process to be controlled, others see benefits in potential expansion. Thus, instead of cooperation, the end result frequently is that communities within metropolitan areas compete to attract the "best" types of development.

The behavior of developers and consumers has also been cited as an underlying cause of the expansion of housing construction at and beyond the urban fringe. In attempting to assemble large tracts of land for housing construction, developers often go beyond the urban fringe to avoid delays and higher costs associated with land use controls and speculation among the typically numerous land owners whose small parcels must be purchased to comprise the tract. Housing consumers as well have shown a preference for the privacy and reduced congestion offered in areas beyond the fringe. Other factors also combine to influence the consumer choice process. Distinct subgroups within this population can be identified based on the magnitude of the importance of factors relevant to their housing preferences. Several homogeneous subgroups of consumers who prefer rural environments near metropolitan areas were described in an earlier phase of this project. The groups are comprised of what we will term as "suburbanites," "exurbanites," and "precluded." It is thought that these three groups should consider different combinations of attributes to be important in their evaluations of residences. A brief description of these consumer types follows.

Suburbanites

One hypothesis is that a rural residence is chosen by a household for similar reasons to other suburban locations, especially if the rural housing is functionally part of the city. However, because it is beyond the

municipal boundaries, it is not legally a part of it. Factors important in the choice of suburban residences are also seen to be important to this subgroup. They include the presence of good schools, open space, reduced crime, lack of pollution, neighbors of similar background, the overall quality of housing and neighborhood, and the availability and cost of public services. Rural housing for this type of consumer is chosen because much of what the suburbs offer can be found in some rural developments and, in addition, property taxes may be lower.

Exurbanites

This consumer group shows preferences for housing at greater distances from the metropolitan fringe. Developments are comprised of large lots and the number of homes is generally less within any given tract. The incomes of this group are higher than those of typical suburbanites. This group has been shown to be attracted by reduced property taxes, more control over levels of public service, increased open space, large lot size, privacy, and natural surroundings. Their decreased accessibility to the urban center may be offset by the possibility that they travel only infrequently to the city.

Precluded

Precluded homeowners are that group who choose rural residences because other suitable housing alternatives are not available within urban areas. If housing is cheaper in rural areas because it is less desirable or less well maintained, then households with lower incomes may regard it as a way to enter the housing market. Low levels of public service provision, accompanied by lower taxes, may be a positive factor in the precluded homeowner's choice of location.

The three groups of residents just described are hypothesized to differ markedly in their reasons for seeking rural housing locations. However, we believe, and will set out to investigate, that these differences result from their differential weighting of the same set of relevant residential attributes. For example, both exurbanites and precluded homeowners consider the attribute "distance to workplace," but they may weight its importance differently. The precluded homeowner may consider this factor to be very important, whereas the exurbanite may not. In the next section, we will develop a list of common factors which were considered relevant to the locational preferences of all housing subgroups.

Pilot Study

Design of the Survey

Many factors have been hypothesized or shown to influence the choice of particular residential locations. To include all these factors in the design used in this study would result in an overly cumbersome instrument. As a result, four factors were chosen which were believed to be of relatively high importance in the residential choice process: the size and arrangement of lots within a development, the monthly mortgage payment, the distance to work and shopping, and the availability of certain public services.

Because the intent of this study was to determine the influence of such factors on people's choice of rural rather than suburban locations, the factors used were varied only for the rural housing alternatives. These alternatives were contrasted to a suburban location given constant values for each of the factors. Thus, the suburban description serves as a "benchmark" against which rural variations could be compared. The values given to the factors associated with the benchmark suburban location were as follows:

A. Lot Size and Arrangement: 1/5-acre lots arranged in a conventional pattern

B. Monthly Mortgage Payment: $500

C. Distance to Work and Shopping: 5 miles to work, 2 miles to shopping facilities offering a range of goods and services typically required

D. Public Services: Public water and sewer, and maintained hard-surfaced streets provided

Against the standard description of the suburban location the factors associated with the rural locations were each allowed to vary over three levels. The range of the values associated with the factors describing the rural locations were given as follows:

A. Lot Size and Arrangement:

1. 1/5 acre, Planned Unit Development
2. ½ acre, Conventionally Arranged
3. 5 acres, Undeveloped

B. Monthly Mortgage Payment:

1. $425
2. $500
3. $650

C. Distance to Work and Shopping:

1. 5 miles to work, 2 miles to shopping
2. 15 miles to work, 7 miles to shopping
3. 25 miles to work, 12 miles to shopping

D. Public Services:

1. Household must provide own water and sewer facilities, streets are unimproved.

2. Household must provide own water and sewer facilities, maintained hard-surfaced streets provided.
3. Public water and sewer and maintained hard-surfaced streets provided.

The objective of the approach was to present comparisons of the suburban benchmark and varying rural alternatives to individuals who would rate the relative desirability, economy, and convenience of the suburban vs. rural alternatives. The three ratings were made on a 15-cm line with the left end labeled "suburban home much more desirable (or economical, or convenient)," and the right end labeled "rural home much more desirable (or economical, or convenient)." Two sample pages are presented in Appendix A. By placing a mark at a point on the line segment, respondents would be able to indicate their judgment of each comparison presented.

A full articulation of the factors chosen to represent the residential choice process would have required the analysis of 242 possible combinations--81 varying rural descriptions, rated on each of three scales. The size implied by such a design raised the possibility that respondents would be overwhelmed by the task and the resulting time required to complete it. Therefore, a fractional factorial design was implemented. By selecting 27 appropriate combinations of the factors, all the individual effects of each factor and two-way interactions of the factors with the monthly mortgage payment factor could be assessed.* In effect, it was felt that the cost factor represented a common denominator which might be "traded off" with the other factors in describing the choice process. This design also allowed us to determine the relative weighting of the factors and to scale the levels of each factor.

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*See Hahn, G. J., and Shapiro, S. S., "A Catalog and Computer Program for the Design and Analysis of Orthogonal Symmetric and Asymmetric Fractional Factorial Experiments," General Electric Research and Development Center, Technical Report No. 66-C-165, Schenectady, New York, May 1966.

In addition to assessing the relative importance of each of the factors for the group of respondents as a whole, the use of the standard suburban option as the means of comparison with rural alternatives on the associated response scales allowed us to obtain an overall preference for rural or suburban housing for each respondent. Thus, in the end, we would be able to state the extent to which a particular respondent was in effect "biased" in favor of rural or suburban housing. Furthermore, it would then be possible to attempt some association between this bias and supplementary personal information supplied by each respondent.

Several respondents argued that if one wanted to know what factors influence residential choice one should simply ask people rather than having them respond to an instrument such as the one used in this study. We suggest that the instrument used yields objective information above and beyond what could have been obtained from verbal responses alone. For example, it is possible a person could report that monthly cost is the most important factor in the choice of residence, but would not be able to state how cost would "trade off" with the other factors. The instrument used in this study allows us to assess both the relative weight of each factor and the extent to which the values of one factor are traded off in light of the values of the others. The use of laboratory-type simulation also allowed us to present hypothetical combinations which are not now, but may be at some time in the future, available. It has also been shown that people are not particularly accurate when rank ordering factors on importance in their decisions. This could be due to the fact that respondents often do not take into account the full range implied by each factor, or how each factor might trade off with others. The method used in this study was designed explicitly to overcome this deficiency.

Respondents

Thirteen people, varying in demographic characteristics, responded to the instrument in the pilot study. Present residences for the respondents ranged from owning their own home to renting an apartment. Past histories ranged from having lived on a farm or in a small town to living in a suburb of a large city (over 150,000 in population). Future housing plans were more homogeneous, with a majority of the respondents estimating that they would be living in a moderately sized city. However, several did state that they would probably be living in a rural non-farm location. In addition to housing information, data were collected on age, income, occupation, and number of children. The age of the sample ranged from 22 to 35; income ranged from under $5,000/yr. to over $20,000/yr. Occupations represented were: secretary, graduate student, and professor. Seven of the thirteen respondents had at least one child and most of these had two children. Thus, for the purposes of the pilot study, this sample of respondents was quite varied in terms of socioeconomic factors and housing history.

Procedure

In order to reflect typical monthly mortgage costs in the study area, respondents were asked to assume the role of a person who had been out of school for five years with an annual household income of $20,000. The cover story also indicated that the person had been living in an urban area near a downtown work place and wished to move out of the central city area. Their present equity was estimated to be $14,000.

Two response booklets followed the cover story and instructions. As seen in Appendix A, the first booklet asked for economy and convenience ratings, while the second booklet requested desirability ratings. These booklets were in turn followed by a questionnaire concerned with the respondent's demographic characteristics.

Results

Analysis of the rating data for the 13 respondents as a group showed that each factor by itself was an important determinant of the desirability, economy, and convenience ratings. Additionally, monthly mortgage cost and distance combined to have an interactive effect on desirability and economy ratings. Long travel distances for rural housing were rated low regardless of mortgage costs. The relative importance of each factor was determined for each of the three ratings and the rank ordering from most to least important was as follows:

(1) Desirability: distance from work and shopping, monthly mortgage cost, public services available, and lot size and arrangement.

(2) Economy: monthly mortgage cost, distance from work and shopping, lot size and arrangement, and public services available.

(3) Convenience: distance from work and shopping, public services available, monthly mortgage cost, and lot size and arrangement.

Scaling of the levels of each factor brought out some interesting points. The desirability, economy, and convenience ratings of housing 5 miles from work were much higher than the same ratings of housing 15 miles from work, but the difference between 15 and 25 miles was not large. Hard-surfaced roads were more important in determining desirability ratings for different levels of public service than was the presence or absence of public water and sewer. As would be expected, the undeveloped 3-acre lot was seen as more desirable than the smaller lot sizes. The monthly mortgage cost factor showed a surprisingly linear relationship with desirability.

We originally thought that economy and convenience would be the main components determining the desirability of the alternatives. A regression analysis was performed to test this hypothesis. Economy and convenience

were found to be important factors in the desirability of alternatives, but they are apparently not the only factors as they accounted for less than half (44%) of the variance in desirability ratings.

It could be argued that even though a respondent gives a rural alternative a high desirability rating, the suburban alternative might be chosen over the rural because of the influence of other (more practical) factors. In order to investigate this possibility, the respondents were given six trials where they were asked to choose between the standard suburban alternative and varying rural alternatives. The relationship between these data and the desirability, economy, and convenience ratings was then assessed. The desirability rating was found to be the best predictor of the choice data. That is, suburban-rural choices were closely related to desirability ratings of suburban vs. rural alternatives.

Although the analysis of the group data yielded some interesting results, the primary goal was to determine how individuals arrive at their decision about where to live. Therefore, the data were also examined on an individual basis. The grand mean for desirability ratings was taken as an indication of a given individual's preference for a suburban or rural residence. It was of some interest to note that for most respondents the grand mean for desirability of rural residences was higher than the means for economy and convenience. This suggests the presence of some untapped factor which favors a rural location. For the time being we have termed this the "rural mystique."

For each individual, the factors were rank ordered in importance for each rating scale (desirability, economy, and convenience). The results of this inspection of the individual data were then discussed with the respondents. The respondents agreed that the analyses had done a good job

of "capturing" their preferences, value systems, and attitudes concerning residential choice. Our confidence in the use of simulated suburban/rural choice tasks was also increased by the correspondence between the mean desirability ratings and the future housing plans of the respondents. However, past housing history did not show a strong relationship to the desirability ratings, but did prove interesting. It appears that of those people who have lived in a rural residence, some have liked it and some have not. Thus, some of the people would like to live in a rural setting again, while others would rather live anywhere but in a rural area. This again points to the need for investigating the individual choice process. Several examples of individual responses are discussed in Appendix B.

Future Work

The pilot study has achieved two purposes. First, it has helped us refine the survey in that we are now confident that the desirability scale alone will yield the information we wish to obtain. Second, it has bolstered our confidence in the validity of the survey in that the respondents agreed with our assessment of their value systems and attitudes. The next step is to take the survey to people who are in the housing market. It is hoped that we will be able to obtain a sample of respondents from each of the subgroups discussed in the introduction: suburbanites, exurbanites, and precludeds.

In order to contact people in the housing market, we intend to work with local realtors. Realtors will be asked for their input on how the survey and questionnaire might be changed to be more appropriate for the sample we wish to obtain. We feel that the realtors will be able to provide us with up-to-date, accurate information on the present housing market and to help us contact people who are looking at suburban and/or rural housing.

Planned Applications

Earlier, it was hypothesized that the factors may be of varying importance to particular subgroups within the population (e.g., suburbanites, exurbanites, precluded). Future applications of this approach would improve in accuracy and reliability if separate models were to be developed for each subpopulation. The identification of the relevant subpopulation could be accomplished through several approaches:

1. A multiple regression using the results of the response scales where groups are identified a priori on the basis of personal demographic characteristics.
2. The use of cluster analysis to determine the extent to which respondents can be assembled into relatively homogeneous subgroups based on their preference ratings.
3. A discriminant analysis to simply identify groups with rural as opposed to suburban bias in housing preferences.

Once the subpopulations have been identified, it would then be possible to relate differences in group demographic characteristics to differences in the parameters of the model. To the extent that differences in personal traits correspond to differences in the model parameters, the possibility of predicting overall housing preferences based on personal factors exists.

It has been long recognized that policy decisions by planners regarding the control or modification of residential land use has a varying effect on identifiable subpopulations, depending on the implied economic and spatial focus of the decision. Thus, a land use control decision may have a differential effect on the welfare of population subgroups. In some cases, this distributional effect may have provided the driving force behind the decision. Whether intended or unintended, however, it is necessary to know

a priori the likely effects such decisions may have. In the future, distributional goals regarding land use control may be more effectively achieved if the decision were couched in terms of explicit consideration of the effects of policies on factors relevant to housing preferences, keeping in mind that the importance of each factor will vary (in a predictable fashion) across each subpopulation. Alternatively, land use planners may wish to consider how a given decision affects factors such as those laid out in this study, and thus the extent to which each subgroup will be affected.

Appendix A

Sample Response Sheets

Economy and Convenience Scales

		Suburban Home	Rural Home
A.	Type of Development and Size of Lot	Conventional 110' x 80'	Planned Unit Development 110' x 80', 1/5 acre
B.	Monthly Mortgage Payment	$500	$650
C.	Distance From Work and Shopping	5 mi. to work 2 mi. to shopping	5 mi. to work 2 mi. to shopping
D.	Public Services	Public water and sewer Hard-surfaced road	Private water and sewer Unimproved road

Suburban home much more economical

Rural home much more economical

Suburban home much more convenient

Rural home much more convenient

Desirability Scale

		Suburban Home	Rural Home
A.	Type of Development and Size of Lot	Conventional 110' x 80'	Undeveloped 3 acres
B.	Monthly Mortgage Payment	$500	$500
C.	Distance From Work and Shopping	5 mi. to work 2 mi. to shopping	25 mi. to work 12 mi. to shopping
D.	Public Services	Public water and sewer Hard-surfaced road	Private water and sewer Hard-surfaced road

Suburban home much more desirable overall

Rural home much more desirable overall

Appendix B

Sample Individual Responses

R. H. showed a very strong suburban bias. The economy scale received the highest ratings* followed by convenience and desirability. Bias was so strong that no factor had an effect on any of the ratings. R. H. indicated that she had previously lived in a rural location and would never do so again.

J. K. also showed a strong suburban bias. Economy and convenience ratings were approximately equal and higher than desirability ratings. Distance and cost (in that order) were the important factors in determining desirability and convenience, while economy was affected by cost alone. J. K. had lived on a farm but expected to be living in a moderately sized city in the future.

D. L. showed a slight suburban bias. Desirability ratings were higher than convenience ratings which were higher than economy ratings. For desirability and convenience, public services were most important followed in order by distance, lot size, and cost. Cost was most important for economy ratings. D. L. had previously lived in a small city and expected to be living in a moderately sized city in the future.

G. E. was one of the respondents from a small city (close to a rural nonfarm) background who showed a rural bias. G. E. gave higher ratings to desirability than to economy and convenience. Distance was the most important factor followed by lot size; cost had very little effect. G. E. expressed a desire to have a large garden to help cut grocery costs. This fits quite well with the importance of lot size in G. E.'s ratings.

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*We will use the term "highest rating" to indicate the rating showing the greatest preference for a rural location.